

# High Resolution XPS investigation of Oxide layer grown on Ge substrates

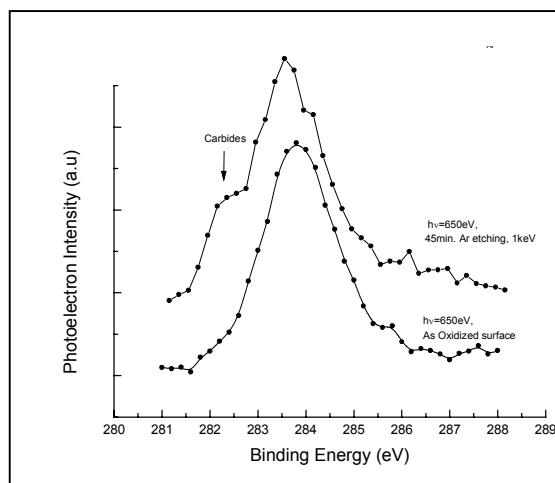
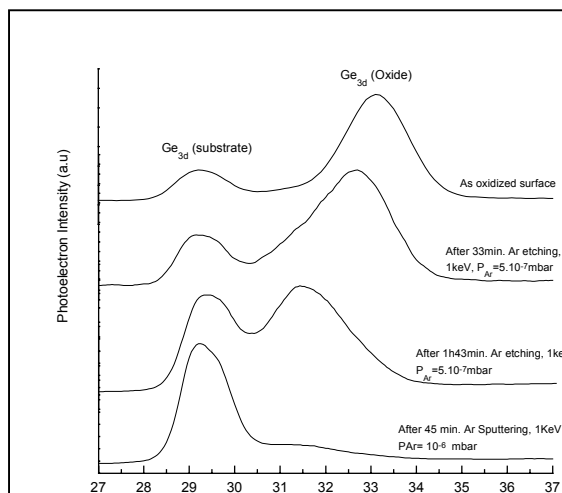
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## Abstract

We present an XPS study of thin oxide layers grown by thermal oxidation of germanium substrate at  $T = 380\text{ }^{\circ}\text{C}$ , under 400 mTorr of dry air. The samples were mechanically then chemically polished prior to the heat treatments. Ge3d, O1s and C1s lines were recorded after successive cycles of ion etching at low Argon pressure. The Ge3d spectra showed a shift of the oxidized germanium peak from 33.2 eV to 31.5 eV binding energy while the peak corresponding to the non-oxidized germanium atoms of the substrate remains fixed at 29.2 eV. The analysis of a  $\text{GeO}_2$  amorphous sample showed no shift in the binding energy of the Ge peaks. The 31.5 eV binding energy peak observed during the analysis of the oxide layer grown on germanium substrate was attributed to the formation of a stable GeO phase under argon bombardment. In addition, the results showed the emergence of a carbon peak of low binding energy ( $E_b=282.3\text{ eV}$ ) at the interface Ge/ $\text{GeO}_2$ . This peak was attributed to the formation of carbides during the heat treatment.



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